CLAIMS

What is claimed is:

1. A variable adaptive mask for use with a physical vapor deposition process, comprising:

a fixed mask portion;

a plurality of channels extending through the fixed mask portion;

means for controlling throughput of a vaporized target material through the channels; and

means for mounting the mask in a fixed position relative to a solid target material and a substrate.

2. The mask of claim 1, wherein the channels are defined by a top layer and a bottom layer of the fixed mask portion.

3. The mask of claim 1, wherein the channels have a circular profile.

4. The mask of claim 1, wherein the channels have a rectangular profile.

5. The mask of claim 2, wherein the means for controlling throughput comprises wires wrapped in a spiral configuration around each of the channels in the top layer and the bottom layer.

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6. The mask of claim 5, wherein the wires generate a magnetic field in the channels when electrical current is passed through the wires.

7. The mask of claim 5, wherein the wires are electrically connected to a computer or integrated circuit such that the magnetic field can be precisely controlled.

8. The mask of claim 1, further comprising a hard ferromagnetic material placed within the channels.

9. The mask of claim 1, wherein the means for controlling throughput comprises strips of material adjacent to the channels and having a high coefficient of thermal expansion such that the material reacts to heat by expanding.

10. The mask of claim 1, wherein the means for mounting comprises at least one mounting hole in the fixed mask portion.

11. The mask of claim 1, further comprising a calibration scale on the fixed mask portion.

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12. A variable adaptive mask for use with a physical vapor deposition process, comprising:

a fixed mask portion;

a plurality of channels extending through the fixed mask portion;

a magnetic control mechanism configured to control throughput of a vaporized target material through the channels; and

one or more mounting holes for mounting the mask in a fixed position relative to a solid target material and a substrate.

13. The mask of claim 12, wherein the channels are defined by a top layer and a bottom layer of the fixed mask portion.

14. The mask of claim 13, wherein the magnetic control mechanism comprises wires wrapped in a spiral configuration around each of the channels in the top layer and the bottom layer.

15. The mask of claim 14, wherein the wires generate a magnetic field in the channels when electrical current is passed through the wires.

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16. The mask of claim 14, wherein the wires are electrically connected to a computer or integrated circuit such that the magnetic field can be precisely controlled.

17. The mask of claim 12, further comprising a hard ferromagnetic material placed within the channels.

18. The mask of claim 12, further comprising a calibration scale on the fixed mask portion.

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19. A variable adaptive mask for use with a physical vapor deposition process, comprising:

a fixed mask portion;

a plurality of channels extending through the fixed mask portion;

a thermal control mechanism configured to control throughput of a vaporized target material through the channels; and

one or more mounting holes for mounting the mask in a fixed position relative to a solid target material and a substrate.

20. The mask of claim 19, wherein the channels have a rectangular profile.

21. The mask of claim 19, wherein the thermal control mechanism comprises strips of material adjacent to the channels and having a high coefficient of thermal expansion such that the material reacts to heat by expanding.

22. The mask of claim 19, further comprising a calibration scale on the fixed mask portion.

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23. A method of controlling a physical vapor deposition process, comprising:

providing a variable adaptive mask comprising:

a fixed mask portion;

a plurality of channels extending through the fixed mask portion; and

a magnetic control mechanism configured to control throughput of a vaporized target material through the channels;

generating a magnetic field in the channels;

directing vaporized target material particles toward the channels such that the particles are affected by the magnetic field which causes a portion of the particles to bend away from a central portion of the channels toward an edge of the channels, wherein the throughput of the vaporized target material particles is proportional to the magnitude of the magnetic field.

24. The method of claim 23, wherein the magnetic control mechanism comprises wires wrapped in a spiral configuration around each of the channels.

25. The method of claim 24, wherein the wires generate the magnetic field in the channels when electrical current is passed through the wires.

26. The method of claim 24, wherein the wires are electrically connected to a computer or integrated circuit such that the magnetic field can be precisely controlled.

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27. A method of controlling a physical vapor deposition process, comprising:

providing a variable adaptive mask comprising:

a fixed mask portion;

a plurality of channels extending through the fixed mask portion; and

a thermal control mechanism configured to control throughput of a vaporized target material through the channels; and

directing vaporized target material particles toward the channels, wherein the throughput of the vaporized target material particles is proportional to the heat applied to the adaptive mask.

28. The method of claim 27, wherein the thermal control mechanism comprises strips of material adjacent to the channels and having a high coefficient of thermal expansion such that the material reacts to heat by expanding.

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